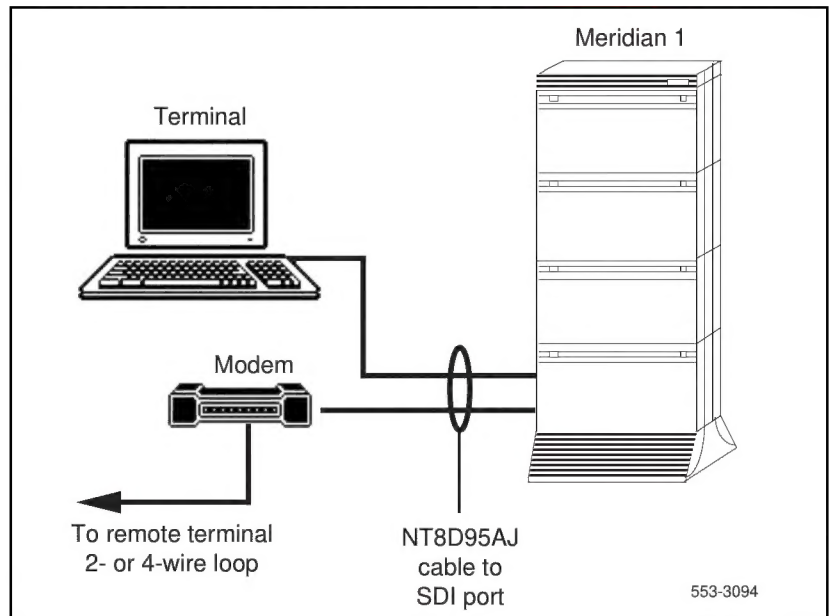


Connecting a system terminal (or modem)

At this point in the installation, a terminal must be connected to a serial data interface (SDI) port to provide an I/O interface to the system. When the installation is complete, a terminal (for local access) or a modem (for remote access) must remain permanently connected to an SDI port to provide a constant I/O interface to the system (see [Figure 53](#)).

Figure 53
Terminal connection diagram



During the initial installation of a dual CPU system, you may want to temporarily install additional terminals for split mode monitoring, or programming, or both.

Note: In options 61 and 71, SDI cards can be temporarily installed in CPU slots during a software conversion. In options 51C, 61C, 81, and 81C, I/O ports on the NT6D66 (or NT9D19) Call Processing (CP) Cards can be used to monitor CPU operations. These configurations should not be used as the permanent I/O connection for the system because the port is only active when the associated CPU, or CPU, is active.

For a modem connection to the Meridian 1, Bell 103/212 compatible dumb modems are recommended for all systems, except options 51C, 61C, 81, and 81C.

CAUTION

If a Hayes command-set compatible (smart) modem is used at the Meridian 1 end, you *must* select the dumb mode of operation, Command Recognition OFF and Command Echo OFF, before connecting the modem to the SDI port. Refer to the modem instructions to set the mode of operation.

If a printer is connected to an SDI port (locally or remotely), you must disable XON/XOFF flow control, so no characters or signals are sent to the port, to avoid a “ping-pong” effect.

Note: For information specific to options 51C, 61C, 81, and 81C, see [“Options 51C, 61C, 81, and 81C terminal and modem connections” on page 116.](#)

Installing a Maintenance Terminal (TTY)

Note: Device 0 and 1 are already programmed in software and do not need to be enabled in software. Device 0 is used for the System Monitor and device 1 is available for the Maintenance TTY.

1 Install and cable a system terminal or a modem:

- Unpack the terminal/modem and place it in its assigned location.
- Install the terminal/modem according to the manufacturer's instructions.
- Connect an NT8D95AJ cable to a matching connector on the terminal/modem.

Note: At a remote location, install and connect a compatible modem and terminal. Connect the NT8D95AJ cable to the modem.

2 Install and cable the SDI card:

- Set the Enb/Dis switch to Dis (down).
- See *Circuit card installation and testing* (553-3001-211) to set the option switches for each port.

See [Figure 54](#) for switch locations on an NT8D41 SDI Paddle Board. (The paddle board cannot be used in options 71, and 81.)

See [Figure 55](#) for switch locations on an NTND02 MSPS Card. (The MSPS card is used in option 21E only.)

- Insert the SDI card into its assigned slot.
- Cable the SDI card:

See [Figure 56](#) to cable the NT8D41 SDI Paddle Board. (There is no faceplate on the paddle board; [Figure 56](#) identifies the ports.)

See [Figure 57](#) to cable an NTND02 MSPS Card.

See [Figure 58](#) to cable a QPC841 Four-Port SDI Card.

- Set the Enb/Dis switch to Enb (up).

3 Connect an NT8D95AJ cable from the terminal to the assigned SDI port.

Installing a secondary system terminal (or modem)

1 Install and cable a system terminal or a modem:

- Unpack the terminal/modem and place it in its assigned location.
- Install the terminal/modem according to the manufacturer's instructions.
- Connect an NT8D95AJ cable to a matching connector on the terminal/modem.

Note: At a remote location, install and connect a compatible modem and terminal. Connect the NT8D95AJ cable to the modem.

2 Install and cable the SDI card:

- Set the Enb/Dis switch to Dis (down).
- See *Circuit card installation and testing* (553-3001-211) to set the option switches for each port.

See [Figure 54](#) for switch locations on an NT8D41 SDI Paddle Board. (The paddle board cannot be used in options 71, and 81.)

See [Figure 55](#) for switch locations on an NTND02 MSPS Card. (The MSPS card is used in option 21E only.)

- Insert the SDI card into its assigned slot.
- Cable the SDI card:

See [Figure 56](#) to cable the NT8D41 SDI Paddle Board. (There is no faceplate on the paddle board; [Figure 56](#) identifies the ports.)

See [Figure 57](#) to cable an NTND02 MSPS Card.

See [Figure 58](#) to cable a QPC841 Four-Port SDI Card.

- Set the Enb/Dis switch to Enb (up).

- 3** Software enable the SDI card:
 - Define each SDI port in the Configuration Record (LD 17).
 - Enable each SDI port using the appropriate software program for the port application. Typical SDI applications and associated programs include:

Terminal and printer ports	LD 37
Call Detail Recording (CDR) ports	LD 42
Automatic Call Distribution (ACD) ports	LD 48
- 4** Connect an NT8D95AJ cable from the terminal, or modem, to the assigned SDI port.

Figure 54
Ports and switches on the NT8D41 SDI Paddle Board

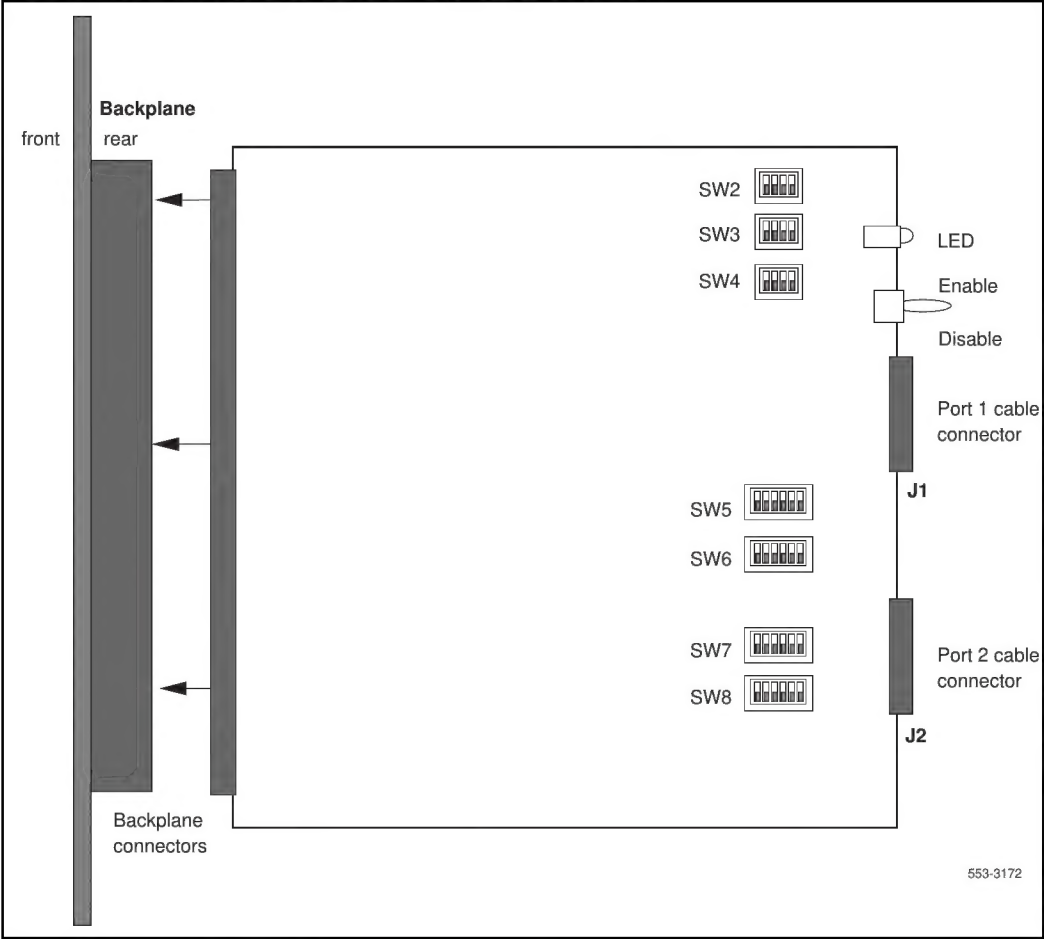


Figure 55
Switch locations on the NTND02 MSPS Card

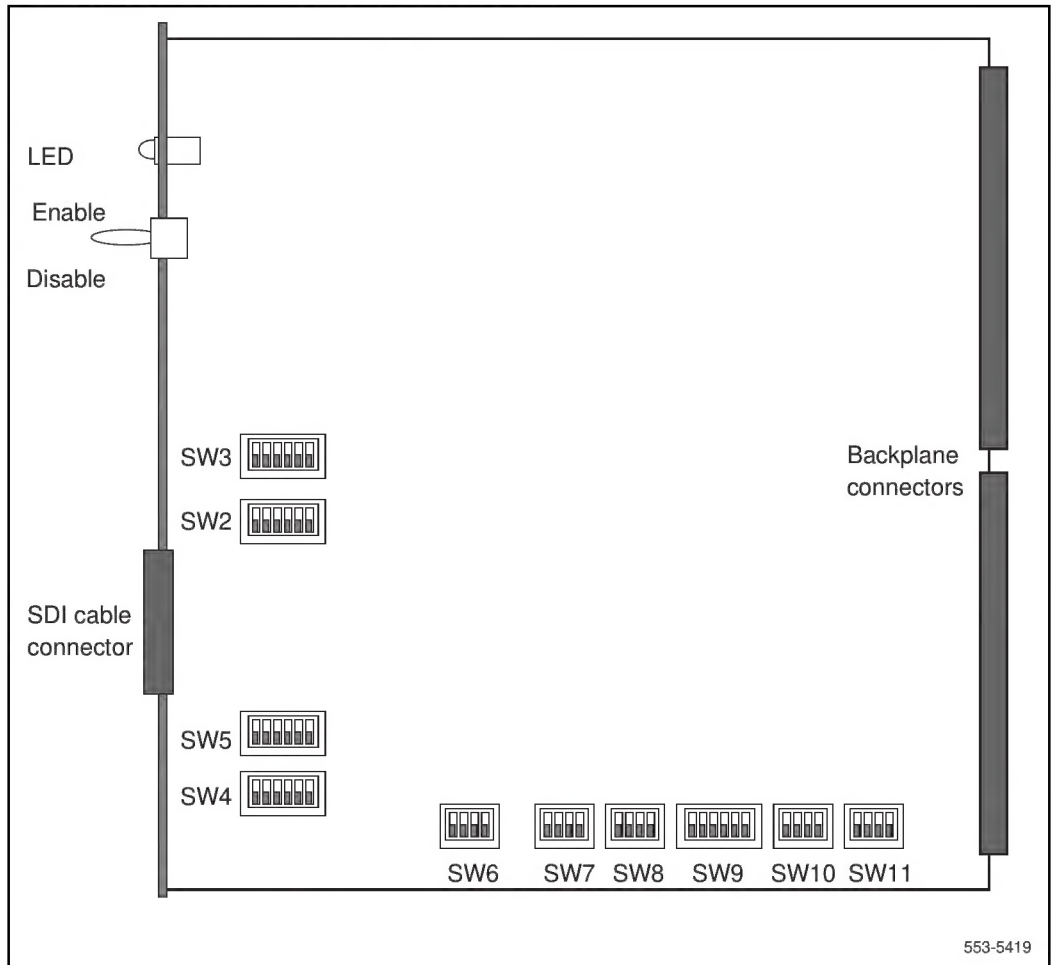


Figure 56
Cabling diagram for the NT8D41 SDI Paddle Board

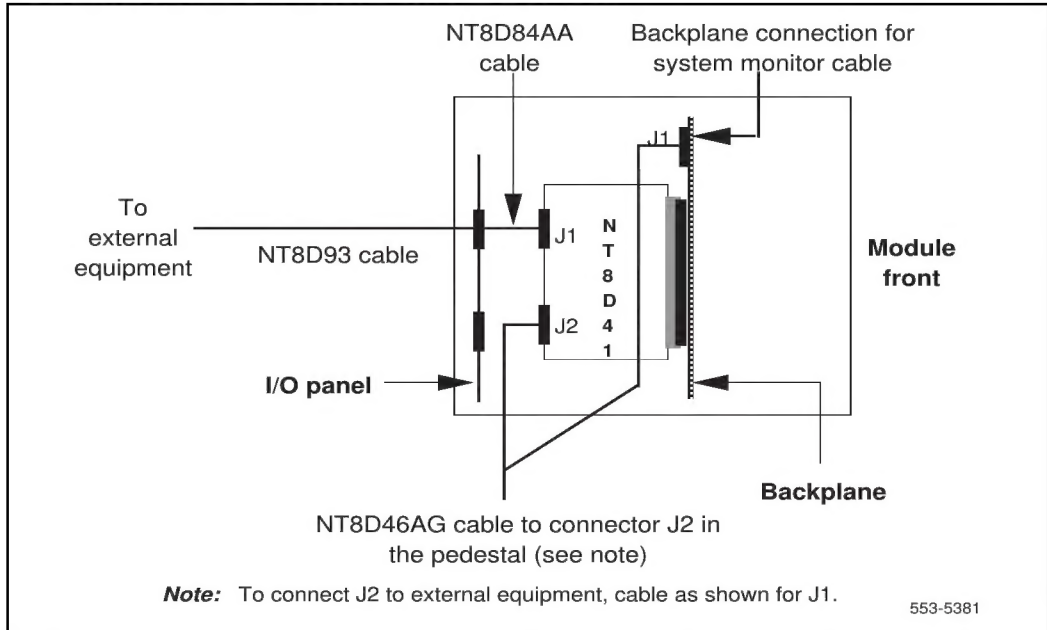


Figure 57
Cabling diagram for the NTND02 MSPS Card

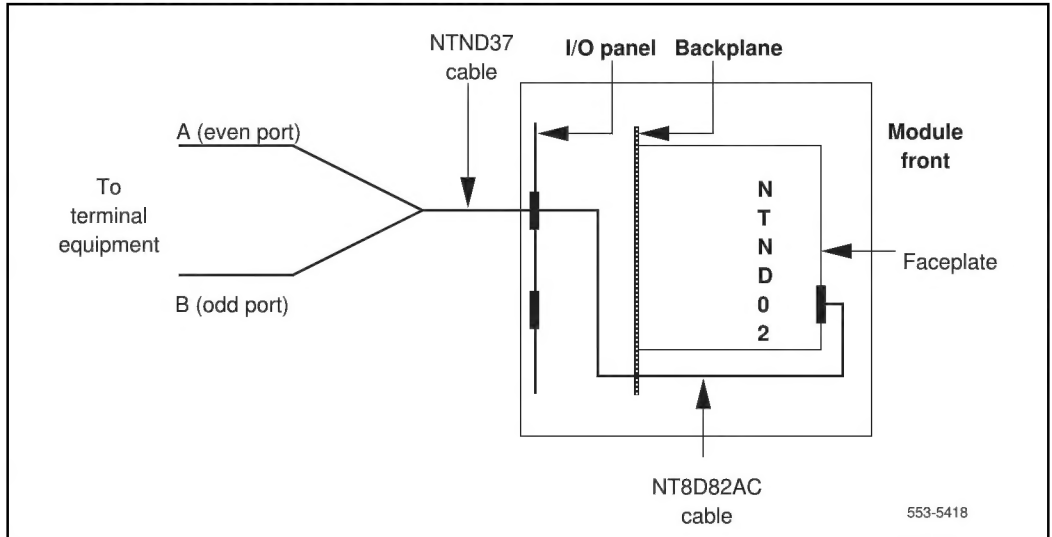
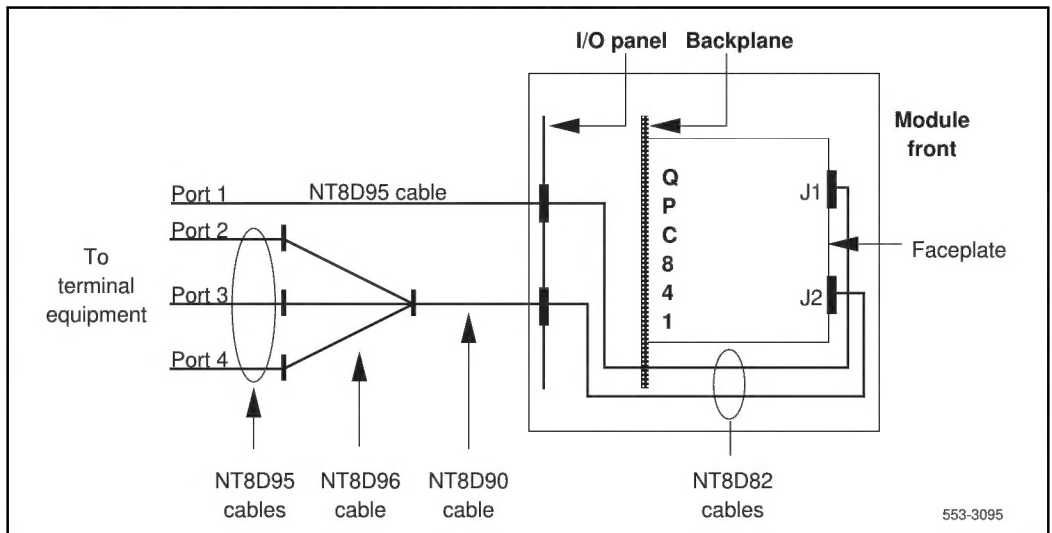


Figure 58
Cabling diagram for the QPC841 Four-Port SDI Card



Options 51C, 61C, 81, and 81C terminal and modem connections

During the system installation and for continuing system operation, a terminal must be connected to an SDI port in a network slot to provide an I/O interface to the active CPU in the system. In addition, a data terminal equipment (DTE) port and a data communication equipment (DCE) port on each NT6D66 or NT9D19 CP Card can be used for direct access to the Core or Core/Network Module that houses the card. Typically, the CPSI ports are preconfigured on I/O addresses four and five.

The CP card ports (CPSI ports) are active only when the CPU associated with the CP card is active. Therefore, the CPSI ports should not be used as the only I/O connection for the system.

When the initial installation is complete, you must leave a terminal or a modem connected to the system. One SDI port in a network slot must be permanently connected to a terminal or modem. On the CPSI ports you can

- disconnect the ports
- leave terminals connected for local monitoring
- connect modems for remote monitoring

The Black Box ABCDE-Switch, which provides up to four-to-one switching, is available from Northern Telecom as part number A0377992. The switch box can be used to connect the SDI and CPSI ports to a terminal or a modem. If used, one switch box must be used for terminals and one for modems.

Options 51C, 61C, 81, and 81C terminal guidelines

During an installation, you can connect terminals to the CPSI ports for split mode monitoring, or programming, or both. (Due to the speed of the system messages displayed, personal computers are useful for file capture and review.) Terminals connected to the CPSI ports can be installed as follows:

- one terminal connects to a CPSI port in one CPU (the cable is switched from module to module as needed); one terminal is required in addition to the terminal for the SDI port connection (see [Figure 59](#))
- one terminal connects to a switch box that connects to a CPSI port in each CPU: one terminal and a switch box are required in addition to the terminal for the SDI port connection (see [Figure 60](#))
- one terminal connects to a switch box that connects to an SDI port and to a CPSI port in each CPU: one terminal and a switch box are required (see [Figure 61](#))

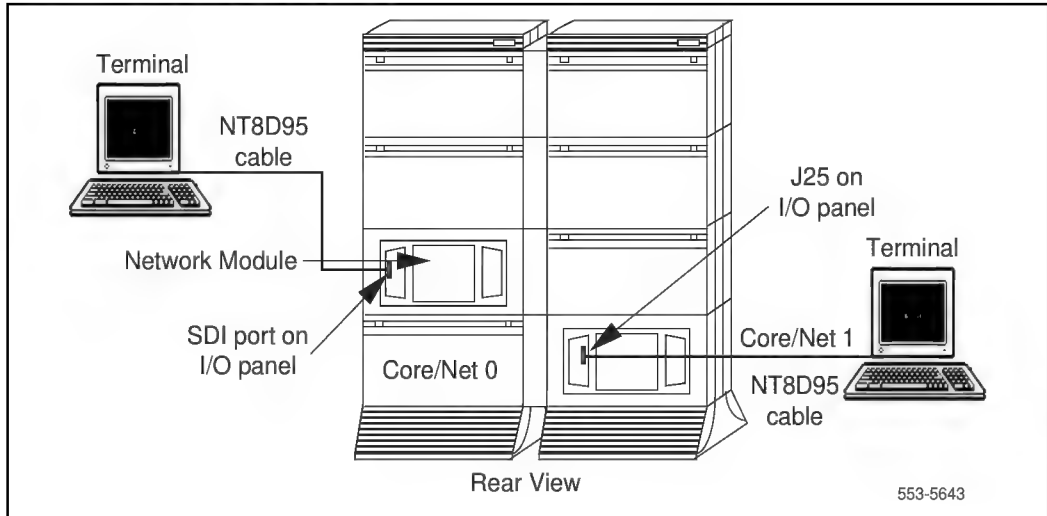
The Option 51C has only one CPU module and requires only one CPSI terminal connection and one SDI port connection. A single terminal with a switch box can be used.

Connecting a terminal to a CPSI port

Use the following procedure to connect a CPSI port directly (no switch box) to a terminal (see [Figure 59](#)):

- Set the terminal to 9600 baud, 7 data, space parity, one stop bit, full duplex, XON.
- Connect an NT8D95 cable to a matching connector on the terminal.
- Connect the NT8D95 cable to J25 on the I/O panel in the rear of the Core or Core/Network Module.
- If you are using only one terminal for both CPSI ports, switch the cable as needed. The terminal connected to the SDI port will always communicate with whichever CPU is active.

Figure 59
One terminal for the CPSI ports

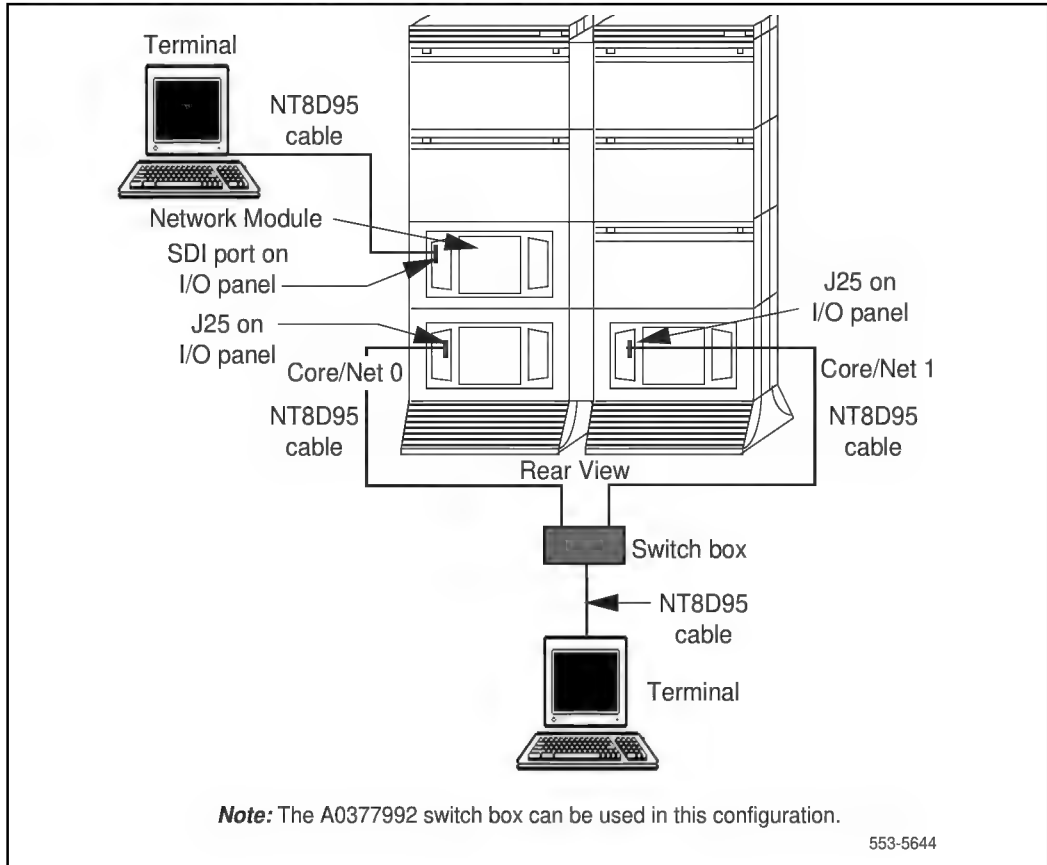


Connecting a switch box and terminal to CPSI ports

Use the following procedure to connect CPSI ports to a switch box and a terminal (see [Figure 60](#)):

- Set the terminal to 9600 baud, 7 data, space parity, one stop bit, full duplex, XON.
- Connect an NT8D95 cable to the terminal and to the switch box.
- Connect NT8D95 cables to a matching connector on the switch box.
If you are using an A0377992 ABCDE box, connect cables as follows:
 - Connect CPU 0 to connector A.
 - Connect CPU 1 to connector B.
- Connect the NT8D95 cables from the switch box to J25 on the I/O panel in the rear of the Core/Network Modules.
- To communicate directly with a CPSI port, switch the cable as needed. The terminal connected to the SDI port will always communicate with whichever CPU is active.

Figure 60
One terminal and a switch box to two CPSI ports

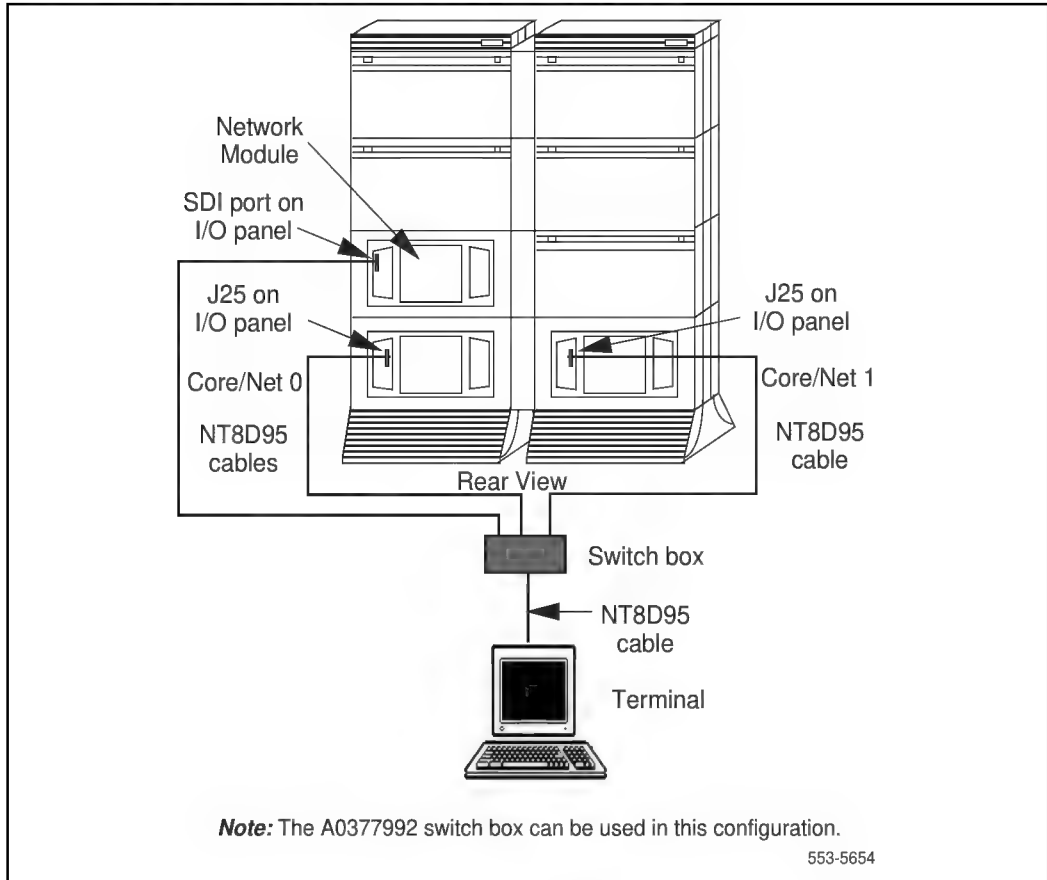


Connecting a switch box and terminal to the SDI and CPSI ports

Use the following procedure to connect CPSI ports to a switch box and a terminal (see [Figures 60](#) and [61](#)):

- Set the terminal to 9600 baud, 7 data, space parity, one stop bit, full duplex, XON.
- Connect an NT8D95 cable to the terminal and to the switch box.
- Connect NT8D95 cables to a matching connector on the switch box.
If you are using an A0377992 ABCDE box, connect cables as follows:
 - Connect CPU 0 to connector A.
 - Connect CPU 1 to connector B.
 - Connect the SDI port to connector D (connector C is common).
- Connect NT8D95 cables from the switch box to J25 on the I/O panel in the rear of each Core or Core/Network Module.
- Connect an NT8D95 cable from the switch box to the I/O panel slot for the SDI card.
- To communicate with the system in general, set the switch box to the SDI port. To communicate directly with a CPSI port, switch the cable as needed.

Figure 61
One terminal and a switch box to the SDI and CPSI ports



Options 51C, 61C, 81, and 81C modem guidelines

You can connect a modem to an SDI port to remotely monitor general system operation. Or you can connect a modem to the CPSI ports for debugging and patch downloading (through your Northern Telecom representative). Or you may want a remote connection to both the SDI and CPSI ports.

At the Meridian 1 end (the local end), modems must be set to dumb mode (command recognition OFF, command echo OFF). Modems at the local end can be connected as follows:

- one modem connects to the SDI port and the cable is switched to each CPSI port as needed (see Table 62 on page 131)
- one modem connects to a switch box that connects to the SDI and CPSI ports (see Table 63 on page 133)

Note: The second method listed here is preferred. Other configurations, such as a separate modem for each port, are possible.

At the remote end, at least one modem (which can be set to smart mode), one terminal, and one RS-232 cable are required in all modem configurations.

Modems at the local end must meet the following required specifications to be compatible with options 51C, 61C, 81, and 81C. Modems that meet the following recommended specifications must also meet the required specifications.

- *Required:* true, not buffered, 9600 baud support (required for remote Northern Telecom technical support)
- *Required:* CCITT V.32 or V.32bis compliance
- *Recommended:* the ability to adjust to lower and higher speeds, depending on line quality, while maintaining 9600 baud at local DTE
- *Recommended:* V.42 error correction
- *Recommended:* V.42 bis data compression

A dispatch or call back modem, normally connected to the SDI port, can be used if it meets the requirements. If you want to use a modem of this type that does not meet the requirements, the modem can only be used in addition to a modem that does meet specifications.

Any modem that meets the required specifications should be compatible with options 51C, 61C, 81, and 81C. The following models have been tested and verified as compatible:

- Hayes V-series ULTRA Smartmodem 9600
- UDS FastTalk V.32/42b
- US Robotics Courier HST Dual Standard V.32bis

The UDS FastTalk modem is available through Northern Telecom as part number A0381391. The modem is equipped with a 6-ft power cord for a standard 110 V ac wall socket and a cable that connects to an RJ11C jack. (The A0377992 Black Box ABCDE-Switch can be used with the UDS FastTalk modem.)

Configuring the Motorola 28.8 Data/Fax Modem

Use the following procedure to configure a Motorola 28.8 Data/Fax Model 3400 modem for operation with options 51C, 61C, 81, and 81C.

The modem can be configured:

- for local mode of operation
- for remote mode of operation

Note: After the modem is configured, power down of the modem will not result in loss of the configuration settings. However, by pushing the RESET button on the modem and holding it down until the “MR” light flashes 5 only, and by releasing the RESET button before the next 5 flashes start, will reset the modem to its factory default settings. It will then be necessary to reconfigure the modem to the settings required for operation with Meridian 1 systems.

Installation procedure

- 1** Unpack the modem and read the installation instructions included with the modem.
- 2** Position the modem in its designated space, install its power cord, and plug it into the power receptacle.
- 3** Connect a 25-pin RS-232 cable to the modem and to a terminal.

Local configuration procedure

- 1** Set the terminal with these parameters:
 - 9600 baud
 - 8 data bits
 - 1 stop bit
 - no parity
- 2** Install the communication utility program shipped with the modem or use an appropriate alternate communication utility program such as Procomm, Telix, SmartCom, Bitcom, or CrossTalk.

- 3 Enter the following command string in one line, followed by the carriage return <cr>:

AT&F \Q0 &S1 S0=1 S7=60 S2=128 Q1 E0 &W &W1 <cr>

After you press the carriage return <cr>, the modem will appear to have stopped functioning. This is normal.

- 4 Power off the modem and connect it to a Call Processor CPSI port in the Meridian 1 system. To do this:

- Set the power switch to OFF.
- Connect the NT8D95 cable between the modem and the J25 on the I/O panel at the rear of the Core/Network module.
- Connect the modem to the telephone jack (RJ11) using the RJ11 telephone cord. If the cord is not supplied, use the NT8D46 cable.
- Turn the power switch on the modem to ON.

The modem is now configured for local communication with the Meridian 1 system.

Remote configuration procedure

To configure a modem in the remote mode, connect the modem as described above in “Local configuration procedure” and proceed as follows:

- 1 To place the modem in the remote configuration mode:
- Press and hold the RESET button until the “MR” light flashes 10 times. There is a 3 second pause before each set of five flashes are received. The “AA” lite comes on at the beginning of the last five flashes and remains on.
 - Do not release the RESET button until you receive all 10 flashes, the “MR”, and the “AA” lights are on. The modem is now placed in the remote mode.
- 2 Dial up the modem at 9600 bps.

Note: Dialing up the modem at a baud rate other than 9600 bps will result in configuration errors.

- 3 Enter five equal signs (====) after you received the connection message.
- 4 Press carriage return <cr> after the PASSWORD prompt appears.
- 5 RC ESTABLISHED prompt will appear. Now you can enter the following commands, each followed by the carriage return <cr>:

ATVQ0	<cr>	Disable Computer Flow Control
AT&S1	<cr>	DSR on when ready to accept data
ATS0=1	<cr>	Answer on the first ring
ATS7=60	<cr>	How long to wait for carrier
ATS2=128	<cr>	Escape sequence character
AT*NT	<cr>	Turn AT command set OFF (very important)
ATQ1	<cr>	Response display OFF
AT&W	<cr>	Write to first profile
AT&W1	<cr>	Write to second profile
AT*RQ	<cr>	End remote configuration and save changes
- 6 The modem is now configured for remote communication with the Meridian 1 system.

Configuring an A0381391 UDS FastTalk modem

Use the following procedure to configure a UDS FastTalk modem for operation with options 51C, 61C, 81, and 81C.

Note: With the exception of the smart/dumb mode jumper setting, configuration changes to the modem are made through software. The modem must remain in smart mode (as shipped) until the software configuration is complete.

- ATE turn off local character echo
- ATS0=2 enable autoanswer on second ring
- ATDT set for tone dialing (default is pulse dialing)
- AT&W store changes in profile 0
- AT&Y use profile 0 at power up

- 1 Disconnect the power cord, RS-232 cable, and any other cables from the modem.
- 2 Remove the top cover on the modem:
 - Stand the unit on its side.
 - Using a medium-size flat screwdriver, lightly pry the four lock tabs off the locks (located on the bottom of the case) and pull the cover away from the modem as the locks release.
- 3 Set the modem to smart mode:
 - Locate the option jumper. The jumper is located just to the left of the speaker (when viewed from the front of the modem).
 - Place the jumper on the two pins farthest from the speaker.
- 4 Connect a 25-pin RS-232 cable to the modem and to a terminal.
- 5 Set the terminal with these parameters:
 - 9600 baud (no other speeds will work)
 - 8 data bits
 - 1 stop bit
 - no parity

Note: The modem will communicate at 9600 bps *only*; the terminal or computer must be set to 9600 bps also.

- 6** Enter the following commands to set compatible parameters. Follow each command with a carriage return (press the “Return” or “Enter” key):

AT&F	load active profile containing factory settings
ATV0	select normal mode, error control disabled
ATVQ0	set serial port flow control
ATV3	form-of-response message = DTE
AT&D2	modem disconnects when DTR signal is lost
AT&S1	select DSR control
ATS0=1	answer after 1 ring
ATS2=128	escape character = ascii 128
ATS7=60	pause 1 second for carrier detection
ATQ1	

After you enter this last command (ATQ1), the modem no longer responds with “OK”. Enter the next command:

AT&W	store active profile
------	----------------------

The modem should respond to every command (except the last two commands) with “OK”. If you do not get this response, turn the modem off and on and try again.

- 7** Disconnect the power cord and serial cable.
- 8** Set the modem to dumb mode:
- Locate the option jumper. The jumper is located just to the left of the speaker (when viewed from the front of the modem).
 - Place the jumper on the two pins closest to the speaker.
- 9** Replace the cover on the modem:
- Align the tabs, locks, and rear guide grooves.
 - Press the cover into place until the locks and the tabs snap together.
- 10** Reconnect the power cord and any other cables that will be used.

Connecting a modem to an SDI port

Use the following procedure to connect an SDI port directly (no switch box) to a modem (see [Figure 62](#)):

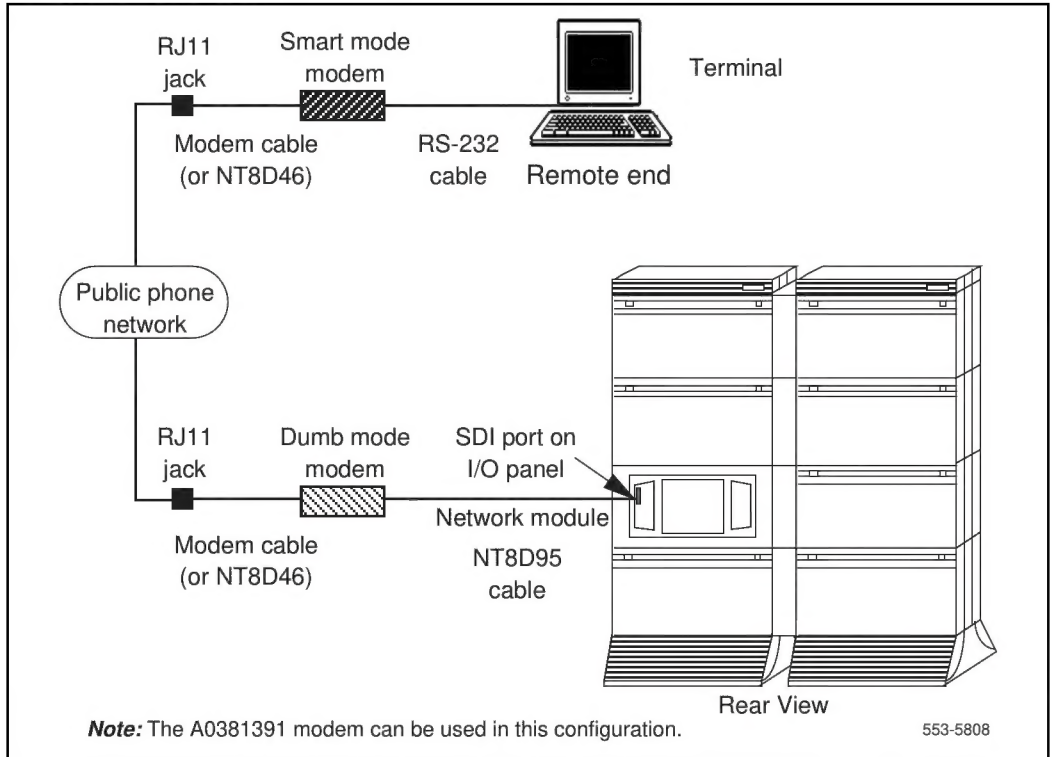
- At the remote end, connect an RS-232 cable to the terminal and to the modem.
- At the remote end, connect the cable from the modem to an RJ11 telephone jack. (If a cable is required, connect an NT8D46 cable to the modem and to the RJ11 jack.)
- At the local end, configure the modem:
 - If you are using an A0381391 UDS FastTalk modem, follow the instructions in this document.
 - If you are using a different type of modem, follow the manufacturer's instructions to set the modem for 9600 baud, autoanswer, dumb mode, command recognition OFF, command echo OFF.
- At the local end, connect an NT8D95 cable to the SDI port on the I/O panel in the rear of the module and to the modem.
- At the local end, connect the cable from the modem to an RJ11 telephone jack. (If a cable is required, connect an NT8D46 cable to the modem and to the RJ11 jack.)
- To communicate with a CPSI port, switch the cable from the modem to the port as needed:
 - For debugging or monitoring, connect the cable to the *active* CPU at J21 on the I/O panel in the rear of the Core/Network Module.
 - For patch downloading, connect the cable to the *inactive* CPU at J21 on the I/O panel in the rear of the Core or Core/Network Module.

Connecting a modem to a switch box and CPSI and SDI ports

Use the following procedure to connect SDI and CPSI ports to a switch box and a modem (see [Figures 63](#) and [64](#)):

- At the remote end, connect an RS-232 cable to the terminal and to the modem.

Figure 62
Modem to SDI port



- At the remote end, connect the cable from the modem to an RJ11 telephone jack. (If a cable is required, connect an NT8D46 cable to the modem and to the RJ11 jack.)
- At the local end, configure the modem:
 - If you are using an A0381391 UDS FastTalk modem, follow the instructions in this document. ([See “Configuring an A0381391 UDS FastTalk modem” on page 128.](#))
 - If you are using a different modem, follow the manufacturer’s instructions to set the modem for 9600 baud, autoanswer, dumb mode, command recognition OFF, command echo OFF.

- At the local end, connect NT8D95 cables to
 - J21 on the I/O panel in the rear of the Core or Core/Network Modules
 - the SDI port on the I/O panel in the rear of the Network module
- At the local end, connect NT8D84 cables to
 - the SDI Paddle Board at the Core/Network backplane to the I/O panel in the rear of the Core/Network Module.
- At the local end, connect NT8D95 cables from the I/O panels to a matching connector on the switch box.

If you are using an A0377992 ABCDE box, connect cables as follows:

 - Connect CPU 0 to connector A.
 - Connect CPU 1 to connector B.
 - Connect the SDI port to connector D (connector C is common).
- At the local end, connect an NT8D95 cable from the switch box to the modem.
- At the local end, connect the cable from the modem to an RJ11 telephone jack. (If a cable is required, connect an NT8D46 cable to the modem and to the RJ11 jack.)
- At the local end, set the switch box as needed to communicate with the CPSI ports:
 - During normal operation, set the switch to the SDI port.
 - For debugging, set the switch to the *active* CPU.
 - For patch downloading, set the switch to the *inactive* CPU.

Figure 63
Modem to a switch box and SDI and CPSI ports (dual-column systems)

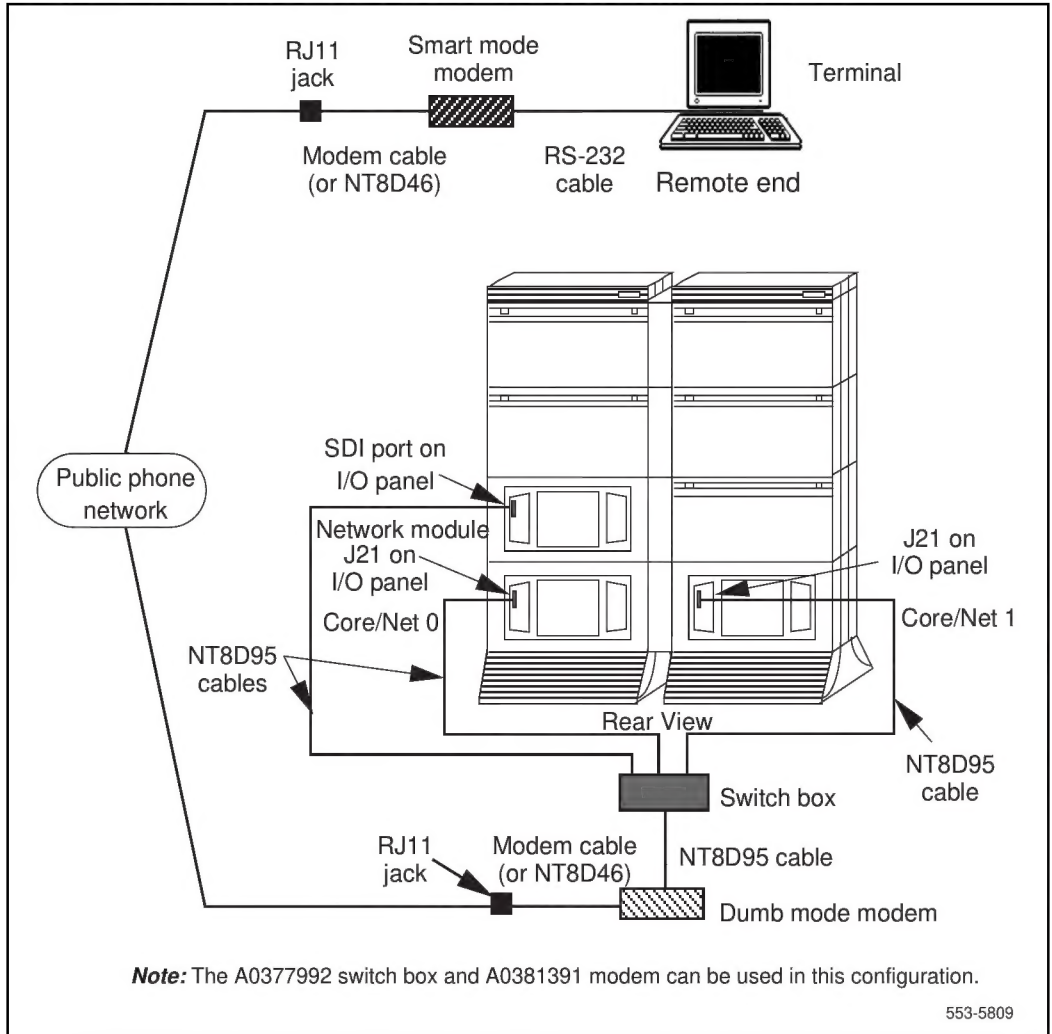


Figure 64
Modem to a switch box and SDI and CPSI ports (single-column systems)

